crystal orientation of an orientation of the cutting plane is integrally grown in the polycrystalline β-SiC plate in conformity with the single crystal α-SiC substrate.

The method of growing single crystal SiC according to a second aspect of the invention is characterized in that, under a state where (2 2 0) Miller index plane of a polycrystalline β-SiC plate is superimposed on a cutting plane of a single crystal α-SiC substrate which is formed by cutting along $(1\ 1\ \bar{2}\ 0)$ Miller index plane $\pm$ 10°, the single crystal α-SiC substrate and the polycrystalline β-SiC plate are heat-treated in an inert gas atmosphere, whereby single crystal having a crystal orientation of an orientation of the cutting plane is integrally grown in the polycrystalline β-SiC plate in conformity with the single crystal α-SiC substrate.

In the thus configured first and second aspects of the invention, a state where the crystal growing conditions in the interface plane are substantially uniformalized, and micropipes of the single crystal α-SiC substrate are not transferred or converted to distortion is obtained by superimposing the planes in which arrangements of Si atoms and C atoms are identical, i.e., the cutting plane along the $(1\ 1\ \bar{2}\ 0)$ Miller index plane $\pm$ 10° of the single crystal α-SiC substrate, and the (2 2 0) Miller index plane of the polycrystalline β-SiC plate, and heat treatment is then conducted in an inert gas atmosphere. As a result, solid phase growth in which the whole region of the interface plane of the polycrystalline β-SiC plate is converted substantially simultaneously and rapidly to α-SiC can be performed. Therefore, it is possible to grow single crystal which is free not only micropipes but also from distortion and residual grain boundaries due to uneven crystal growth rates, so that single crystal SiC of very high quality can be obtained. Consequently, it is possible to attain an effect of expediting practical use of single crystal SiC which has excellent high-temperature property, high-frequency property, dielectric property, and

resistance to environments as compared with existing semiconductor materials, and which is therefore expected as a semiconductor material for a next-generation power device.

Preferably, polycrystal which is produced in a plate-like form by the thermal chemical vapor deposition method (hereinafter, referred to as the thermal CVD method) is used as the polycrystalline β-SiC plate. In this case, since a polycrystalline β-SiC plate itself is of high purity and has no defects such as voids, grain boundaries or the like are not formed between the cutting plane of the single crystal α-SiC substrate and the (2 2 0) plane of the polycrystalline β-SiC plate, so that single crystal SiC of higher quality can be obtained.

C1 end

In the method of growing single crystal SiC according to the second aspect of the invention, each of at least one cutting plane of the single crystal α-SiC substrate, and at least one (2 2 0) Miller index plane of the polycrystalline β-SiC plate may be processed into a smooth mirror face of 10 angstroms RMS or less. According to this configuration, the planes can be closely contacted with each other without leaving a gap therebetween. Therefore, single crystal SiC of high quality in which residual distortion and grain boundaries are not produced in the interface plane and which is substantially free from micropipe defects can be grown and supplied efficiently and stably on an industrial scale.--

Please replace the last paragraph on page 9 which extends to the first two lines of page 10, with the following:

C2

--Crystal X-ray analysis was conducted using an X-ray diffractometer on samples of the single crystal SiC which were grown in the manner described above. As a result, it was confirmed that the single crystal portion 4 grown in the polycrystalline β-SiC plate 2 is single crystal α-(6H)-SiC which has the crystal orientation of the orientation of $(1\ 1\ \bar{2}\ 0)$ in conformity with the single